

DESERT VIEW ESTATES WATER CORPORATION (PWS 4010042) SOURCE WATER ASSESSMENT FINAL REPORT

January 9, 2002



State of Idaho Department of Environmental Quality

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Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the Act. This assessment is based on a land use inventory of the designated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

This report, *Source Water Assessment for Desert View Estates Water Corporation, Kuna, Idaho*, describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The Desert View Estates Water Corporation drinking water system consists of three wells. There were four wells but Well #1 is no longer in use. Therefore, it was not assessed. Well #2 has a high susceptibility to inorganic, volatile organic, and synthetic organic contaminants, and it has moderate susceptibility to microbial contaminants. Well #3 has a high susceptibility to inorganic contaminants and moderate susceptibility to volatile organic, synthetic organic, and microbial contaminants. Well #4 has a high susceptibility to all potential contaminant categories due to the location of a road that ends within 40 feet of the wellhead. The scores of Well #2 and Well #3 also reflect the high hydrologic sensitivity score and the moderate system construction score as well as the nitrate and pesticide priority areas surrounding the wells.

None of the wells has recorded the presence of synthetic organic or volatile organic contamination during any water chemistry tests. No total coliform bacteria have been detected at the wellheads or in the distribution system. The inorganic contaminants barium, cadmium, selenium, and fluoride have been detected, but at levels far below the current maximum contaminant levels (MCLs) set by the Environmental Protection Agency (EPA). Arsenic has been detected in the well system in concentrations of 4 parts per billion (ppb), below the recently revised MCL of 10 ppb. The EPA lowered the arsenic MCL from 50 ppb to 10 ppb in October 2001, giving all public water systems until 2006 to comply with the new standard. All wells have nitrate concentrations in the water at levels below the MCL. However, the recorded nitrate concentrations of Well #2 and Well #3 have a statistically significant upward trend. In December 1993, Well #2 recorded a nitrate concentration of 3.96 milligrams per liter (mg/L) and Well #3 recorded a concentration of 3.01 mg/L. In June 1997, nitrate concentrations had risen to 4.11 mg/L in Well #2 and 4.53 mg/L in Well #3. In November 1999, nitrate concentrations had risen again to 4.42 mg/L in Well #2 and 4.71 mg/L in Well #3. In addition, the surrounding agricultural lands have led to the area being classified as a nitrate priority area as well as a priority area for the pesticides atrazine and alachlor.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

For the Desert View Estates Water Corporation, drinking water protection activities should first focus on correcting any deficiencies outlined in the sanitary survey (an inspection conducted every five years with the purpose of determining the physical condition of a water system's components and its capacity). No application or storage of herbicides, pesticides, or other chemicals is allowed within 50 feet of a public water system well. Minimizing the use of the road that comes within 40 feet of Well #4 may need to be considered to avoid contamination of the well water from chemical spills or releases occurring on the road. Since the delineations underlie urban and residential land, storm water drainage may be an important consideration. Much of the designated protection areas are outside the direct jurisdiction of the Desert View Estates Water Corporation, making collaboration and partnerships with state and local agencies and industry groups critical to the success of drinking water protection. All wells should maintain sanitary standards regarding wellhead protection. Should microbial contamination become a problem, appropriate disinfection practices would need to be maintained for the system.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan as the delineations contain some urban and residential land uses. Public education topics could include proper lawn and garden care practices, household hazardous waste disposal methods, proper care and maintenance of septic systems, and the importance of water conservation to name but a few. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the U.S. Environmental Protection Agency. As there are major transportation corridors through the delineations, the Idaho Department of Transportation should be involved in protection activities. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the Ada Soil and Water Conservation District, and the Natural Resources Conservation Service.

A community must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Boise Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR DESERT VIEW ESTATES WATER CORPORATION, KUNA, IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the rankings of this assessment mean.** Maps showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are included. The list of significant potential contaminant source categories and their rankings used to develop the assessment are also included.

Background

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

Level of Accuracy and Purpose of the Assessment

Since there are over 2,900 public water sources in Idaho, there is limited time and resources to accomplish the assessments. All assessments must be completed by May of 2003. An in-depth, site-specific investigation of each significant potential source of contamination is not possible. **Therefore, this assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality (DEQ) recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a drinking water protection program should be determined by the local community based on its own needs and limitations. Wellhead or drinking water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

The public drinking water system for Desert View Estates Water Corporation is comprised of three ground water wells that serve approximately 650 people through 213 connections. The wells are located in Ada County, approximately ¼ mile south of Kuna Road and approximately ¼ mile west of Five Mile Road in the Desert View Estates subdivision (Figure 1). Water is stored in a 65,000 gallon elevated storage tank. Occasional system chlorination, using liquid chlorine, is employed at Well #3.

No current water chemistry problems exist for the three wells of the Desert View Estates Water Corporation system. Nitrate concentrations in Well #2 and Well #3 have been increasing with a statistically significant upward trend. However, nitrate concentrations of the wells have never exceeded the MCL of 10 mg/L. The arsenic level in the water system has been detected at 4 ppb, a level less than the recently revised MCL of 10 ppb. EPA lowered the arsenic MCL from 50 ppb to 10 ppb in October 2001, giving all public water systems until 2006 to comply with the new standard. None of the wells has recorded the presence of volatile organic contaminants (VOCs) or synthetic organic contaminants (SOCs) during any water chemistry tests. Total coliform bacteria have been detected in Well #3 with several single-hit detections. However, there have been no repeat detections of the bacteria at any of the wellheads. The inorganic contaminants (IOCs) barium, cadmium, selenium, and fluoride have been detected in the drinking water system at levels below the MCLs set by EPA. However, the surrounding agricultural lands have led to the area being classified as a nitrate priority area as well as a priority area for the pesticides atrazine and alachlor.

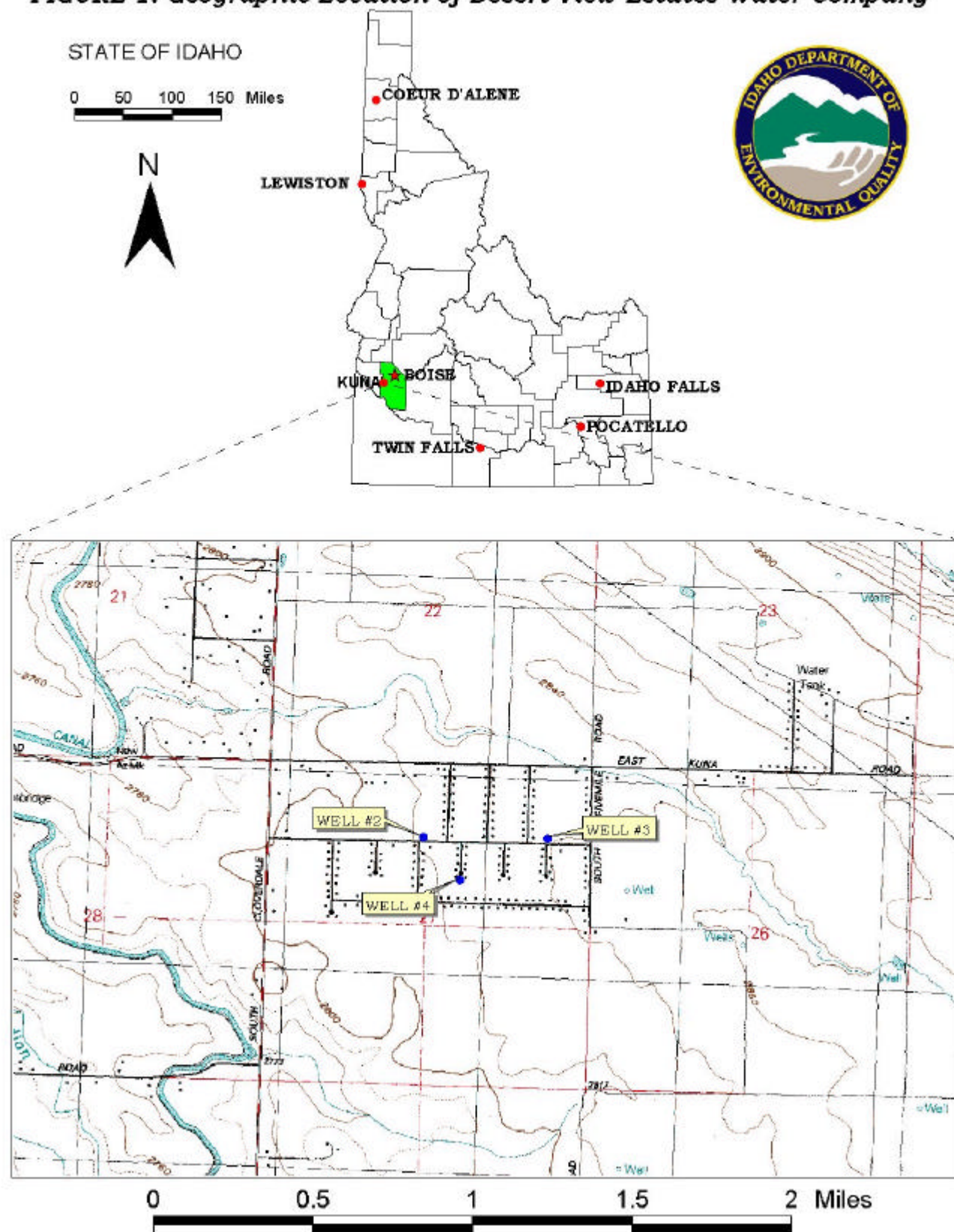
Defining the Zones of Contribution – Delineation

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time-of-travel (TOT) zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. DEQ contracted with BARR Engineering to perform the delineations using a combination of MODFLOW and a refined analytical element computer model approved by the EPA in determining the 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) TOT for water associated with the Boise Valley aquifer in the vicinity of the Desert View Estates Water Corporation. The computer models used site specific data, assimilated by BARR Engineering from a variety of sources including the Desert View Estates Water Corporation well logs, other local area well logs, and hydrogeologic reports (detailed below).

The ground water system underlying the western part of the area is recharged with water from the Boise River. This recharge results from leakage from the many irrigation canals, laterals, and ditches that cross the area and from downward percolation of applied irrigation water. Leakage directly from the channel of the Boise River between Lucky Peak and Barber Dams also recharges the ground water system.

The lower sand and gravel unit underlies the western portion of the area, south of Kuna. It consists of lenticular beds of poorly sorted gravel and sand with lesser amounts of silt and clay. The sediments were derived from the mountains to the north and deposited on a rolling topography by the ancient

FIGURE 1. Geographic Location of Desert View Estates Water Company



Boise River and tributary stream. These sediments are believed to provide hydraulic connection for some ground water recharge from the present Boise River. Local artesian conditions are present.

The basalt unit consists of a thick sequence of lava flows deposited from a chain of volcanoes, which paralleled the Snake River during Middle Pleistocene time. These flows filled the then existing valleys and low areas to approximately 3,000 feet elevation. The contacts between flows are vesicular or porous and broken. Cinder beds and clay lenses were deposited between many flows. The thickness of the unit varies from as little of 40 feet to as much as 600 feet. Wells commonly yield more than 2,000 gpm.

Torrential streams issuing from the mountains to the north during Upper Pleistocene time deposited the upper sand and gravel unit. The unit ranges from silt to cobble-size granite, with small amounts of basalt and metamorphic rocks. Individual beds are very discontinuous. The thickness of the unit varies widely, but is believed to be over 900 feet. The well production from this aquifer varies from 1,000 to 3,000 gpm.

Recharge to the aquifers is mainly derived from the Boise River and the New York Canal and associated irrigation. It is not believed that a significant quantity of recharge is derived from precipitation either on the mountainous regions or the plateau. Regional ground water flow is from northeast to southwest.

The delineated source water assessment areas for the Desert View Estates Water Corporation can best be described as northeastward trending corridors approximately 4 miles long and ½ mile wide (Figures 2, 3, and 4). These delineations head northeastward crossing the Pleasant Valley area and then turning northward crossing the New York Canal in the 10-year time of travel (TOT) zone. The actual data used by BARR Engineering in determining the source water assessment delineation areas are available from DEQ upon request.

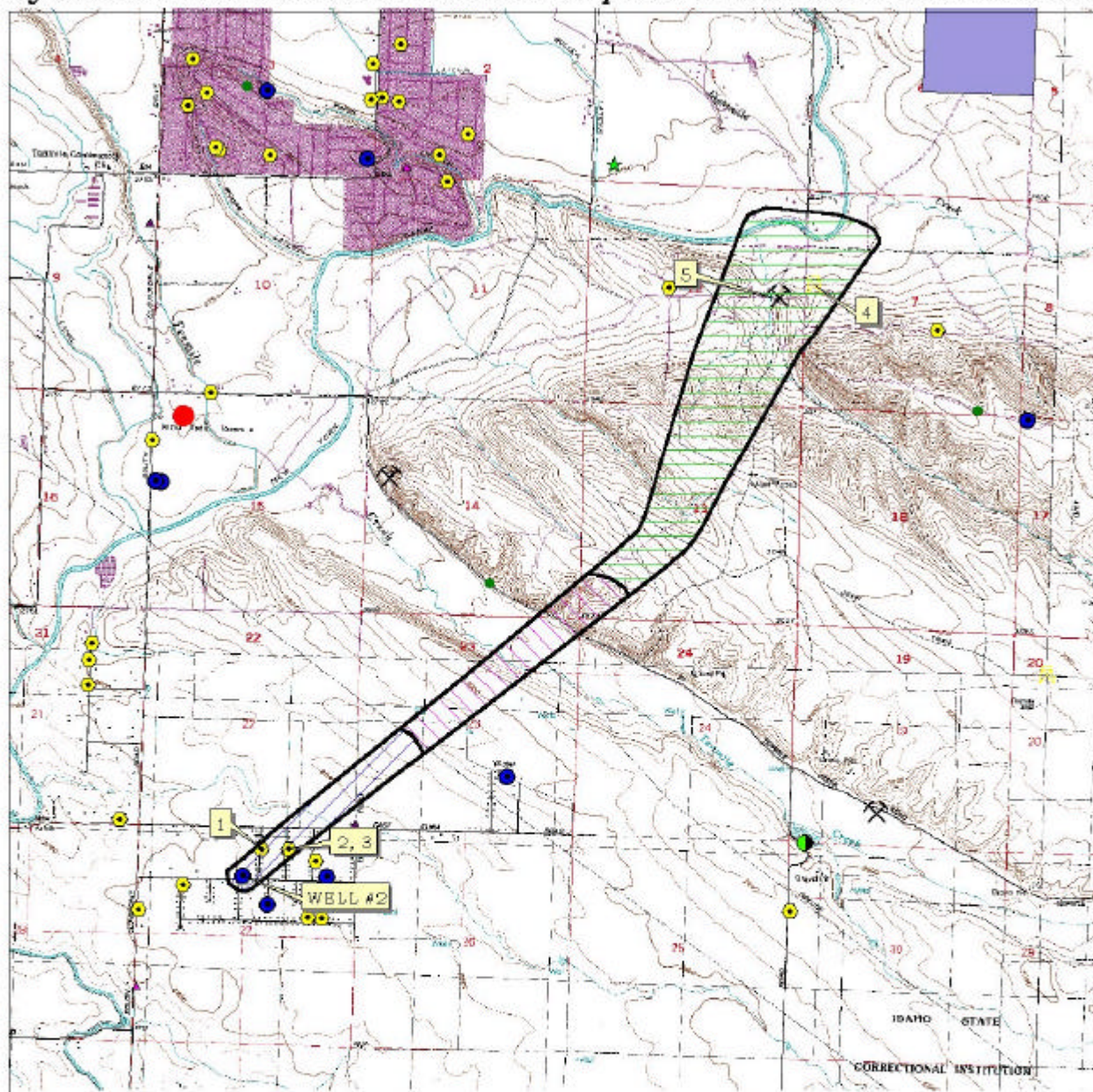
Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of groundwater contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by DEQ and from available databases.

Land use within the immediate area of the Desert View Estates Water Corporation wellheads consists of residential and urban, while the surrounding area is predominantly irrigated agriculture and rangeland.

It is important to understand that a release may never occur from a potential source of contamination provided they are using best management practices. Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due

Figure 2. Desert View Estates Water Co. Delineation Map and Potential Contaminant Source Locations

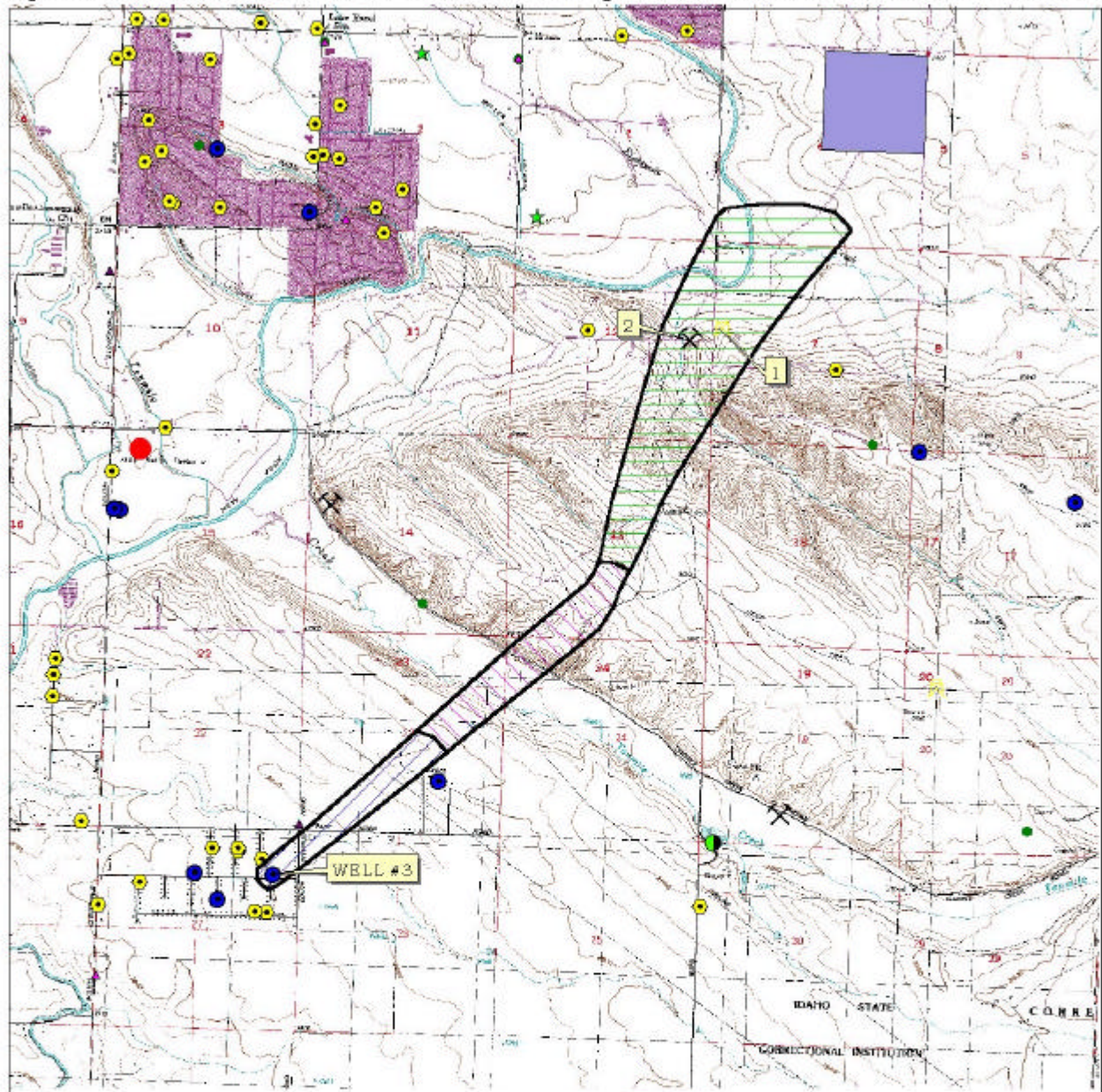


0 0.5 1 1.5 2 2.5 3 Miles



PWS# 4010042
WELL #2

Figure 3. Desert View Estates Water Co. Delineation Map and Potential Contaminant Source Locations

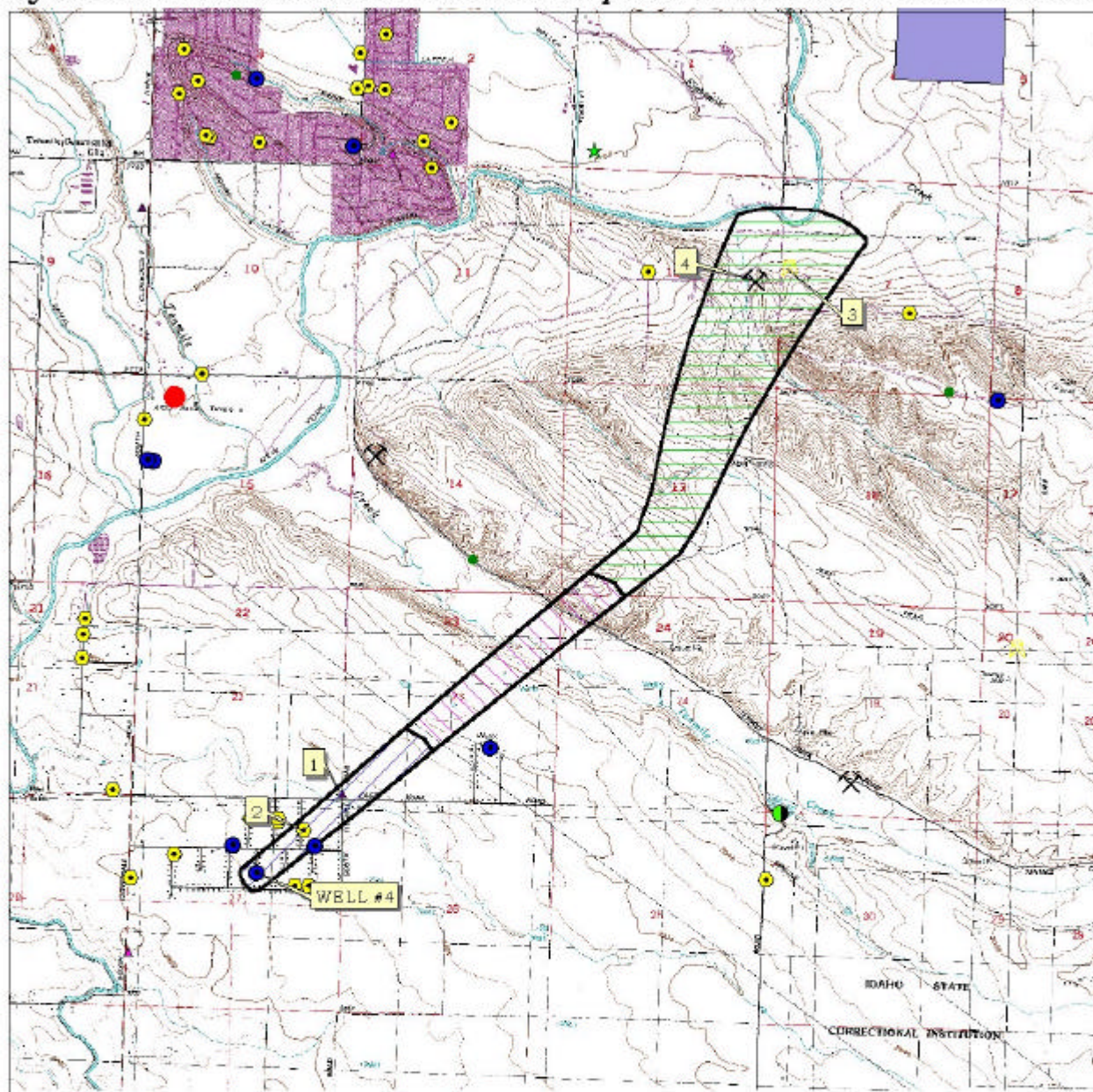


0 0.5 1 1.5 2 2.5 3 Miles



PWS# 4010042
WELL #3

Figure 4. Desert View Estates Water Co. Delineation Map and Potential Contaminant Source Locations



0 0.5 1 1.5 2 2.5 3 Miles



PWS# 4010042
WELL #4

to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, including educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

Contaminant Source Inventory Process

A two-phased contaminant inventory of the study area was conducted in October and November 2001. The first phase involved identifying and documenting potential contaminant sources within the Desert View Estates Water Corporation source water assessment areas (Figures 2, 3, and 4) through the use of computer databases and Geographic Information System maps developed by DEQ. The second, or enhanced, phase of the contaminant inventory involved contacting the operator to identify and add any additional potential sources in the area.

The delineated source water areas contain the New York Canal as a potential source of contamination. This surface water could potentially contaminate the aquifer with leachates or surface runoff. The delineations also include a welding shop, a window cleaning business, an underground storage tank (UST), an engine repair shop, a toxic release site (TRI) and a gravel pit (Tables 1, 2, and 3 below). A spill occurring at any of these sites could contribute IOC, VOCs, and SOC to the aquifer. According to the 1999 Ground Water Under Direct Influence (GWUDI) field survey, the septic system for the subdivision is within 500 feet of Well#2 and Well #3. Additionally, the 1999 GWUDI indicates that a road ends within 40 feet of Well #4. Though not listed in the tables, these sources were used in assessing the susceptibility of the wells.

Table 1. Desert View Estates Water Corporation, Well #2, Potential Contaminant Inventory

SITE #	Source Description ¹	TOT Zone ² (years)	Source of Information	Potential Contaminants ³
1	Welding	0 – 3	Database Search	IOC, VOC, SOC
2	Window Cleaning	0 – 3	Database Search	IOC, VOC, SOC
3	Body Shop	0 – 3	Enhanced	IOC, VOC, SOC
4	TRI site	6 – 10	Database Search	IOC, VOC, SOC
5	Gravel Pit	6 – 10	Database Search	IOC, VOC, SOC
	New York Canal	6 – 10	GIS Map	IOC, VOC, SOC

¹ TRI = toxic release inventory, UST = underground storage tank

² TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead

³ IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Table 2. Desert View Estates Water Corporation , Well #3, Potential Contaminant Inventory

SITE #	Source Description ¹	TOT Zone ² (years)	Source of Information	Potential Contaminants ³
1	TRI site	6 - 10	Database Search	IOC, VOC, SOC
2	Gravel Pit	6 - 10	Database Search	IOC, VOC, SOC
	New York Canal	6 - 10	GIS Map	IOC, VOC, SOC

¹ TRI = toxic release inventory, UST = underground storage tank

² TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead

³ IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Table 3. Desert View Estates Water Corporation, Well #4, Potential Contaminant Inventory

SITE #	Source Description ¹	TOT Zone ² (years)	Source of Information	Potential Contaminants ³
1	UST – Closed	0 - 3	Database Search	VOC, SOC
2	Engines Rebuilding & Repairing	0 - 3	Database Search	IOC, VOC, SOC
3	TRI site	6 - 10	Database Search	IOC, VOC, SOC
4	Gravel Pit	6 - 10	Database Search	IOC, VOC, SOC
	New York Canal	6 - 10	GIS Map	IOC, VOC, SOC

¹ TRI = toxic release inventory, UST = underground storage tank

² TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead

³ IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Section 3. Susceptibility Analyses

Each well's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. Attachment A contains the susceptibility analysis worksheets. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

The hydrologic sensitivity rating of a well is dependent upon four factors: the surface soil composition, the material in the vadose zone (between the land surface and the water table), the depth to first ground water, and the presence of a 50-foot thick fine-grained zone above the producing zone of the well. Slowly draining soils such as silt and clay typically are more protective of ground water than coarse-grained soils such as sand and gravel. Similarly, fine-grained sediments in the subsurface and a water depth of more than 300 feet protect the ground water from contamination.

Hydrologic sensitivity is high for all wells (Table 4). The well logs indicate that the vadose zone of all of the wells is composed predominantly of lava rock and gravel. In addition, regional data indicates that the area is predominantly composed of soils in the moderate to well-drained class and the first ground water is found at approximately 220 feet below ground surface (bgs).

Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. System construction scores are reduced when information shows that potential contaminants will have a more difficult time reaching the intake of the well. Lower scores imply a system is less vulnerable to contamination. For example, if the well casing and annular seal both extend into a low permeability unit, then the possibility of contamination is reduced and the system construction score goes down. If the highest production interval is more than 100 feet below the water table, then the system is considered to have better buffering capacity. If the wellhead and surface seal are maintained to standards, as outlined in sanitary surveys, then contamination down the well bore is less likely. If the well is protected from surface flooding and is outside the 100-year floodplain, then contamination from surface events is reduced. A sanitary survey for each well was conducted in 1997.

All wells have a moderate system construction score. The static water table is located at about 220 feet bgs for all of the wells. Well #2, drilled in 1990, has 0.250-inch thick, 12-inch casing to 18.5 feet bgs into “gray lava” and 0.250-inch thick, 10-inch casing from 18.5 feet to 278 feet bgs into “fine gravel”. The annular seal was installed to a depth of 18.5 feet bgs into “gray lava”. The well is screened from 278 to 324 feet bgs. Well #3, drilled in 1975, has 0.385-inch thick, 10-inch casing to 300 feet bgs into “cobble stones”. The annular seal was installed to a depth of 20 feet bgs into “hard-broken lava”. Well #3 is screened from 300 to 330 feet bgs. Well #4, drilled in 1978, has 0.375-inch thick, 12-inch casing to 274 feet bgs into “streaks of brown clay & cemented sand & gravel”. It is screened from 274 to 318 feet bgs. The annular seal was installed to a depth of 20 feet bgs into “solid black lava”. The 1997 sanitary surveys show that the wellhead and surface seals meet standards for all wells, and the wells are properly protected from surface flooding.

The available well logs allowed a determination as to whether current public water system (PWS) construction standards are being met. Though the wells may have been in compliance with standards when they were completed, current PWS well construction standards are more stringent. The Idaho Department of Water Resources *Well Construction Standards Rules* (1993) require all PWSs to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works* (1997) during construction. Some of the regulations deal with screening requirements, aquifer pump tests, surface casing vent, and thickness of casing. Table 1 of the *Recommended Standards for Water Works* (1997) lists the required steel casing thickness for various diameter wells. Twelve-inch diameter wells require a casing thickness of 0.375-inches and ten-inch diameter wells require a casing thickness of 0.365-inches. The wells were assessed an additional point in the system construction rating even though they may have met standards at the time of installation.

Potential Contaminant Source and Land Use

Well #2 and Well #4 rate moderate for IOCs (i.e. nitrates, arsenic), VOCs (i.e. petroleum products), and SOCs (i.e. pesticides) and rate low for microbial contaminants (i.e. bacteria). Well #3 rates moderate for IOCs, and rates low for VOCs, SOCs, and microbial contaminants. The limited number of potential contaminant sources within the delineations contributed to the lower scores. However, the delineations of Well #2 and Well #4 contained the largest number of sources that could contribute leachates to the aquifer, resulting in a higher score. The nitrate and pesticide priority areas also contributed to the final land use rating.

Final Susceptibility Ranking

A detection above a drinking water standard MCL, any detection of a VOC or SOC, or a detection of total coliform bacteria or fecal coliform bacteria at the wellhead will automatically give a high susceptibility rating to a well despite the land use of the area because a pathway for contamination already exists. Additionally, storing potential contaminant sources within 50 feet of a wellhead will automatically lead to an high susceptibility rating. In this case, the 1997 GWUDI indicates the presence of a road within 40 feet of Well #4, giving automatic high scores for all potential contaminant categories. Hydrologic sensitivity and system construction scores are heavily weighted in the final scores. Having multiple potential contaminant sources in the 0- to 3-year time of travel zone (Zone 1B) and agricultural land contribute greatly to the overall ranking. In terms of total susceptibility, Well #2 rates high for IOCs, VOCs, and SOCs and rates moderate for microbial contaminants. Well #3 rates high for IOCs and rates moderate for VOCs, SOCs and microbial contaminants. Well #4 rates high for all potential contaminant categories.

Table 4. Summary of Desert View Estates Water Corporation Susceptibility Evaluation

Well	Susceptibility Scores ¹									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	Final Susceptibility Ranking			
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
Well #2	H	M	M	M	L	M	H	H	H	M
Well #3	H	M	L	L	L	M	H	M	M	M
Well #4	H	M	M	M	L	M	H*	H*	H*	H*

¹H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility,

IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

* = Automatic high score due to the proximity of a road within 40 feet of the wellhead

Susceptibility Summary

Well #2 rated high for IOCs, VOCs, and SOCs and rated moderate for microbial contaminants. Well #3 rated high for IOCs, and moderate for VOCs, SOCs, and microbial contaminants. Well #4 automatically rated high for all potential contaminant categories due to the road that ends within 40 feet of the wellhead. The susceptibility ratings of Well#2 and Well #3 can be attributed to the high hydrologic sensitivity score, the moderate system construction score as well as the potential contaminant sources in the 3-year and 10-year TOTs that could possibly contribute leachable contaminants to the aquifer.

No current water chemistry problems exist for the three wells of the Desert View Estates Water Corporation system. Nitrate concentrations in Well #2 and Well #3 have been increasing with a statistically significant upward trend. However, nitrate concentrations of the wells have never exceeded the MCL of 10 mg/L. The arsenic level in the water system has been detected at 4 ppb, a level less than the recently revised MCL of 10 ppb. The EPA lowered the arsenic MCL from 50 ppb to 10 ppb in October 2001, giving all public water systems until 2006 to comply with the new standard. None of the wells has recorded the presence of VOCs or SOCs during any water chemistry tests. Total coliform bacteria have been detected in Well #3 with several single-hit detections. However, there have been no repeat detections of the bacteria at any of the wellheads. The IOCs barium, cadmium, selenium, and fluoride have been detected in the drinking water system at levels below the MCLs set by the EPA. However, the surrounding agricultural lands have led to the area being classified as a nitrate priority area as well as a priority area for the pesticides atrazine and alachlor.

Section 4. Options for Drinking Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective drinking water protection program is tailored to the particular local drinking water protection area. A community with a fully developed drinking water protection program will incorporate many strategies. For the Desert View Estates Water Corporation, drinking water protection activities should first focus on correcting any deficiencies outlined in the sanitary survey (an inspection

conducted every five years with the purpose of determining the physical condition of a water system's components and its capacity). No application or storage of herbicides, pesticides, or other chemicals is allowed within 50 feet of a public water system well. Minimizing the use of the road that comes within 40 feet of Well #4 may need to be considered to avoid contamination of the well water from chemical spills or releases occurring on the road. Since the delineations underlie urban and residential land, storm water drainage may be an important consideration. Much of the designated protection areas are outside the direct jurisdiction of the Desert View Estates Water Corporation, making collaboration and partnerships with state and local agencies and industry groups critical to the success of drinking water protection. All wells should maintain sanitary standards regarding wellhead protection. Should microbial contamination become a problem, appropriate disinfection practices would need to be maintained.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan as the delineations contain some urban and residential land uses. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the U.S. Environmental Protection Agency. As there are transportation corridors through the delineations, the Idaho Department of Transportation should be involved in protection activities. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the Ada Soil and Water Conservation District, and the Natural Resources Conservation Service.

A community must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Boise Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

Assistance

Public water supplies and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Boise Regional DEQ Office (208) 373-0550

State DEQ Office (208) 373-0502

Website: <http://www2.state.id.us/deq>

Water suppliers serving fewer than 10,000 persons may contact John Bokor, Idaho Rural Water Association, at 1-800-962-3257 for assistance with wellhead protection strategies.

POTENTIAL CONTAMINANT INVENTORY

LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund, is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100-year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

References Cited

- Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 1997. *Recommended Standards for Water Works*.
- Idaho Department of Agriculture, 1998. Unpublished Data.
- Idaho Department of Environmental Quality, 1997. Design Standards for Public Drinking Water Systems. IDAPA 58.01.08.550.01.
- Idaho Department of Water Resources, 1993. Administrative Rules of the Idaho Water Resource Board: Well Construction Standards Rules. IDAPA 37.03.09.
- Ralston, D.R. and S.L. Chapman. 1970. *Ground Water Resources of Southern Ada County and Western Elmore County, Idaho*. Idaho Department of Reclamation. Water Information Bulletin #15. 52 pages.
- Wuolo, R.W., J. Wittman, and D.M. Reynolds, 2001. *Summary Report: Delineation of Public Drinking Water Sources for the Source Water Assessment Program: Boise Valley and Mountain Home Plateau*. BARR, Minneapolis, August 2001.

Attachment A

Desert View Estates Water Corporation Susceptibility Analysis Worksheets

The final scores for the susceptibility analysis were determined using the following formulas:

- 1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)
- 2) 2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.375)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

≥ 13 High Susceptibility

Ground Water Susceptibility Report

Public Water System Name :

Public Water System Number 4010042

DESERT VIEW ESTATES WATER CORPORATION

Well# : WELL #2

11/15/2001 12:55:21 PM

1. System Construction		SCORE			
Drill Date	8/23/1990				
Driller Log Available	YES				
Sanitary Survey (if yes, indicate date of last survey)	YES	1997			
Well meets IDWR construction standards	NO	1			
Wellhead and surface seal maintained	YES	0			
Casing and annular seal extend to low permeability unit	NO	2			
Highest production 100 feet below static water level	NO	1			
Well located outside the 100 year flood plain	YES	0			
Total System Construction Score		4			
2. Hydrologic Sensitivity					
Soils are poorly to moderately drained	NO	2			
Vadose zone composed of gravel, fractured rock or unknown	YES	1			
Depth to first water > 300 feet	NO	1			
Aquitard present with > 50 feet cumulative thickness	NO	2			
Total Hydrologic Score		6			
3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	URBAN/COMMERCIAL	2	2	2	2
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		2	2	2	2
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	4	3	3	1
(Score = # Sources X 2) 8 Points Maximum		8	6	6	2
Sources of Class II or III leacheable contaminants or	YES	4	3	3	
4 Points Maximum		4	3	3	
Zone 1B contains or intercepts a Group 1 Area	YES	2	0	2	0
Land use Zone 1B 25 to 50% Irrigated Agricultural Land		2	2	2	2
Total Potential Contaminant Source / Land Use Score - Zone 1B		16	11	13	4
Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
Land Use Zone II Less than 25% Agricultural Land		0	0	0	
Potential Contaminant Source / Land Use Score - Zone II		0	0	0	0
Potential Contaminant / Land Use - ZONE III					
Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	
Total Potential Contaminant Source / Land Use Score - Zone III		2	2	2	0
Cumulative Potential Contaminant / Land Use Score		20	15	17	6
4. Final Susceptibility Source Score		14	13	13	12
5. Final Well Ranking		High	High	High	Moderate

1. System Construction		SCORE			
Drill Date	5/15/1975				
Driller Log Available	YES				
Sanitary Survey (if yes, indicate date of last survey)	YES	1997			
Well meets IDWR construction standards	NO	1			
Wellhead and surface seal maintained	YES	0			
Casing and annular seal extend to low permeability unit	NO	2			
Highest production 100 feet below static water level	NO	1			
Well located outside the 100 year flood plain	YES	0			
Total System Construction Score		4			
2. Hydrologic Sensitivity					
Soils are poorly to moderately drained	NO	2			
Vadose zone composed of gravel, fractured rock or unknown	YES	1			
Depth to first water > 300 feet	NO	1			
Aquitard present with > 50 feet cumulative thickness	NO	2			
Total Hydrologic Score		6			
3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	IRRIGATED CROPLAND	2	2	2	2
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		2	2	2	2
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	1	0	0	1
(Score = # Sources X 2) 8 Points Maximum		2	0	0	2
Sources of Class II or III leacheable contaminants or	YES	3	0	0	
4 Points Maximum		3	0	0	
Zone 1B contains or intercepts a Group 1 Area	YES	2	0	2	0
Land use Zone 1B 25 to 50% Irrigated Agricultural Land		2	2	2	2
Total Potential Contaminant Source / Land Use Score - Zone 1B		9	2	4	4
Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
Land Use Zone II 25 to 50% Irrigated Agricultural Land		1	1	1	
Potential Contaminant Source / Land Use Score - Zone II		1	1	1	0
Potential Contaminant / Land Use - ZONE III					
Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	
Total Potential Contaminant Source / Land Use Score - Zone III		2	2	2	0
Cumulative Potential Contaminant / Land Use Score		14	7	9	6
4. Final Susceptibility Source Score		13	11	12	12
5. Final Well Ranking		High	Moderate	Moderate	Moderate

1. System Construction		SCORE			
Drill Date	9/22/1978				
Driller Log Available	YES				
Sanitary Survey (if yes, indicate date of last survey)	YES	1997			
Well meets IDWR construction standards	NO	1			
Wellhead and surface seal maintained	YES	0			
Casing and annular seal extend to low permeability unit	NO	2			
Highest production 100 feet below static water level	NO	1			
Well located outside the 100 year flood plain	YES	0			
Total System Construction Score		4			
2. Hydrologic Sensitivity					
Soils are poorly to moderately drained	NO	2			
Vadose zone composed of gravel, fractured rock or unknown	YES	1			
Depth to first water > 300 feet	NO	1			
Aquitard present with > 50 feet cumulative thickness	NO	2			
Total Hydrologic Score		6			
3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	URBAN/COMMERCIAL	2	2	2	2
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	YES	YES	YES	YES
Total Potential Contaminant Source/Land Use Score - Zone 1A		2	2	2	2
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	1	2	2	1
(Score = # Sources X 2) 8 Points Maximum		2	4	4	2
Sources of Class II or III leacheable contaminants or	YES	1	2	2	
4 Points Maximum		1	2	2	
Zone 1B contains or intercepts a Group 1 Area	YES	2	0	2	0
Land use Zone 1B 25 to 50% Irrigated Agricultural Land		2	2	2	2
Total Potential Contaminant Source / Land Use Score - Zone 1B		7	8	10	4
Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
Land Use Zone II 25 to 50% Irrigated Agricultural Land		1	1	1	
Potential Contaminant Source / Land Use Score - Zone II		1	1	1	0
Potential Contaminant / Land Use - ZONE III					
Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	
Total Potential Contaminant Source / Land Use Score - Zone III		2	2	2	0
Cumulative Potential Contaminant / Land Use Score		12	13	15	6
4. Final Susceptibility Source Score		12	13	13	12
5. Final Well Ranking		High	High	High	High